

Application No.: 10/654,369
Attorney Docket No.: LSP-50
Amendment Dated: July 21, 2005
Reply for Office Action Dated: 17 May 2005

AMENDMENTS TO THE CLAIMS

1. (CURRENTLY AMENDED): A method of treating a workpiece by applying shockwaves thereto, comprising the steps of:

applying an energy-absorbing overlay to a portion of a surface of the workpiece, said energy-absorbing overlay being
5 composed of a liquid material resistant to dissolution by the transparent water overlay and resistant to drying;

applying a transparent overlay upon said energy-absorbing overlay; and

directing a pulse of coherent energy to said energy-
10 absorbing overlay, said pulse of coherent energy being absorbed at least in part by said liquid material and causing a portion of said energy-absorbing overlay to vaporize and thereby generate at least one shockwave for transmission to the workpiece.

2. (ORIGINAL): The method of claim 1, wherein said liquid erosion-resistant and drying-resistant material has a combined viscosity and level of adherence such that said energy-absorbing overlay made thereof tends to conform and adhere to the
5 workpiece under substantially static conditions yet is capable of fluid displacement when subjected to at least one shockwave.

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3. (ORIGINAL): The method of claim 1, wherein said liquid erosion-resistant and drying-resistant material is a colloidal substance having at least one energy-absorbing particulate dispersed therein.

4. (ORIGINAL): The method of claim 3, wherein said colloidal substance is a mixture of an oil and graphite.

5. (ORIGINAL): The method of claim 3 wherein said colloidal substance is a mixture of oil and black iron oxide (Fe_2O_3).

6. (ORIGINAL): The method of claim 3 wherein said colloidal substance is a mixture of oil, colloidal graphite and black iron oxide (Fe_2O_3).

7. (ORIGINAL): The method of claim 1, wherein said energy-absorbing overlay has a viscosity of a magnitude that permits said energy-absorbing overlay to conform with a surface of the workpiece under substantially static conditions and yet to be fluidly displaced when subjected to sufficiently dynamic conditions.

8. (ORIGINAL): The method of claim 7, wherein the sufficiently dynamic conditions occur during at least one of

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said applying an energy-absorbing overlay step and said directing a pulse step.

9. (ORIGINAL): The method of claim 1, wherein said energy-absorbing overlay includes at least a first overlay portion and a second overlay portion, said first overlay portion being sacrificed upon impact of the pulse of coherent energy, said
5 second overlay portion being reusable for a subsequent shockwave creation.

10. (ORIGINAL): The method of claim 9, wherein the second overlay portion is fluidly displaced laterally along the workpiece surface, away from an impingement point of the pulse of coherent energy, an amount of the second overlay portion
5 being displaced into an other proximate treatment location upon the workpiece.

11. (ORIGINAL): The method of claim 10, comprising the further steps of:

applying a transparent overlay on the amount of the second overlay portion displaced into the other proximate treatment
5 location; and

directing a pulse of coherent energy through the transparent overlay to the amount of the second overlay portion

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displaced into the other proximate location to effect a
shockwave formation thereat.

12. (ORIGINAL): The method of claim 11, further comprising
the steps of:

monitoring the amount of the second overlay portion
displaced into the other proximate treatment location, said
5 monitoring thereof being performed prior to the step of applying
the transparent overlay thereto; and

adjusting a total thickness of the energy-absorbing overlay
existing at the other proximate treatment location to thereby
conform with a desired thickness therefor.

13. (ORIGINAL): The method of claim 1, further comprising
the step of reclaiming any remaining amount of said energy-
absorbing overlay.

14. (ORIGINAL): The method of claim 1, wherein the coherent
energy is in a form of laser energy.

15-20. (CANCELED)

21. (CURRENTLY AMENDED): A method of treating a workpiece
by applying shockwaves thereto, comprising the steps of:

applying an energy-absorbing overlay to a portion of a
surface of the workpiece, said energy-absorbing overlay being

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5 composed of an adherent, uniformly spreading liquid material,
said adherent, uniformly spreading liquid material being
resistant to drying;

applying a transparent overlay upon said energy-absorbing
overlay; and

10 directing a pulse of coherent energy to said energy-
absorbing overlay, said pulse of coherent energy being absorbed
at least in part by said liquid material and causing a portion
of said energy-absorbing overlay to vaporize and thereby
generate at least one shockwave for transmission to the
15 workpiece.

22. (CURRENTLY AMENDED): The method of claim 21, wherein
said adherent, uniformly spreading liquid material displaces
easily enough laterally when sprayed so as to thereby reach a
coating thickness having a self-limiting maximum.

23. (CURRENTLY AMENDED): The method of claim 21, further
comprising the step of:

one of pre-coating and pre-spraying the workpiece with ~~said~~
another adherent, uniformly spreading liquid material prior to
5 said step of applying said energy-absorbing overlay, said

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another adherent, uniformly spreading liquid material being
resistant to drying.

24. (CURRENTLY AMENDED): The method of claim 23, wherein
said step of applying said energy-absorbing overlay includes
supplying said adherent, uniformly spreading liquid material at
locations where it is needed and one of lacking and supplied at
5 an insufficient thickness.

25. (ORIGINAL): The method of claim 21, further comprising
the step of:

cleaning the workpiece after the treating of the workpiece
by applying shockwaves thereto, said step of cleaning the
5 workpiece being a spray cleaning technique.

26. (ORIGINAL): The method of claim 21, wherein a
plurality of spots are treated during the treating of the
workpiece, said energy-absorbing overlay being applied to each
of said spots individually, said method further comprising the
5 step of:

removing said energy-absorbing overlay from each said spot
after performing the step of directing the pulse of said
coherent energy upon said each said spot.

27. (ORIGINAL): The method of claim 21, further comprising the step of:

using an automated means for ensuring at least one of that a correct amount of said energy-absorbing overlay has been applied at a given treatment spot and that the laser beam has been applied at the given treatment spot prior to a next treatment step being performed.

28. (ORIGINAL): The method of claim 27, wherein said automated means is configured for measuring an applied amount of said energy-absorbing overlay, said automated means being one of a mass/flow meter, a video monitor, a plasma monitor, and an acoustic monitor.

29. (ORIGINAL): The method of claim 21, wherein at least one first spray nozzle is used for applying said energy-absorbing overlay, at least one second spray nozzle being used for applying said transparent overlay, each said first spray nozzle and each said second spray nozzle having a protector fitted therewith, each said protector being configured for shielding a segment of the workpiece from potential damage from a coating material being ejected through a given said spray nozzle.

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30. (NEW): The method of claim 21, wherein said drying-resistant liquid material is a colloidal substance having at least one energy-absorbing particulate dispersed therein.

31. (NEW): The method of claim 30 wherein said colloidal substance is a mixture of oil and black iron oxide (Fe_2O_3).

32. (NEW): The method of claim 30 wherein said colloidal substance is a mixture of oil, colloidal graphite and black iron oxide (Fe_2O_3).

33. (NEW): The method of claim 21, further comprising the step of reclaiming any remaining amount of said energy-absorbing overlay.